USER MANUAL

Exalto windshield wiper type 235 KK 12/24 Volt

catalogue number 2154.00/05/10/15/20 (12 Volt)

catalogue number 2155.00/05/10/15/20 (24 Volt)

version 3 - 2000

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Safety

Although Exalto windshield wipers are easy to install, a fair amount of technical knowledge (mechanical and electrical) is required of the technician. Consult the manual or your vendor in case of doubt on installation or functioning.

Safety symbols

! An exclamation mark in front of the text warns, that injury or damage can occur if a procedure is badly performed.

Dangers

The installation and use of Exalto wipers doesn't inflict any personal dangers or damage, provided that installation is done according to the requirements.

- Never remove covers or other safety provisions, unless maintenance is being performed and all safety requirements are obeyed.
- The installer must provide all necessary covers.
- ! Always isolate the electrical circuit when performing maintenance. Prevent the installation from being started (accidentally) by others.

Safety provisions

Safety provisions protect the user against contact with moving, electrical or hot parts. Some of them must be provided by the installer. There are several safety provisions:

- housing: covers moving parts of the drive.
- plastic cover (optional): covers the motor and electrical connections. If not used, the installer must provide another cover or place the wiper behind a panel.
- Make sure the wiper has enough ventilation when it is placed behind a panel or when a cover is applied.
- Place a fuse (see specifications) in the main cable.

Safety requirements

Before the Exalto wiper is installed, we strongly recommend the following:

- Read the entire manual before installation.
- Keep your working environment as well as the wiper parts clean.
- Check to be sure no parts are missing or damaged.
- Use only well maintained tools and have them within reach when installing.
- Handle the parts with care.
- Never install or maintain the wiper with the electrical voltage applied, unless this is specifically mentioned in the manual.
- Clear your tools after installation.

Use of the manual

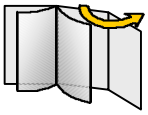
Read the entire manual before installation. In this manual you can find the following expressions and symbols:

Hint!
Gives you advice on how to perform a task more easily.

Attention!
Alerts you to possible problems and safety warnings.

Careful!
Warns if the product can be damaged when working carelessly.

Warning!
You can hurt yourself or damage the product severly.



Look at folding page / at back of manual
Unfold the folding page or look at the back of the manual for a drawing.

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1 Introduction

With this user manual we want to guide you in the installation and use of the Exalto windshield wiper. Follow all instructions and install all safety provisions.

1.1 Introduction

The Exalto windshield wipers are especially designed to keep working even with the most extreme weather conditions at sea. All external parts are made of corrosion resistant materials. The housing of the self-lubricating bearings is made of bronze. All arms and blades have a black, weather-resistant coating, to prevent reflection.

Wiper type 235 KK is designed to be mounted in the bulkhead. The wiper arc is adjustable from 40° to 90° with steps of 5°. By standard the 235 KK can be supplied for bulkhead thicknesses of 20, 55, 75, 100 and 125 mm. The pantograph arms are adjustable in length, to set the wipe area accurately. The 12V motor of the 235 KK is not insulated and has a negative earth. The 24V motor has an insulated earth return.

1.2 Environmental factors

In the wiper, materials are used that are harmful for the environment (e.g. copper). At disposal of the wiper, parts can be re-used or recycled well. No harmful materials can get off when using or disassembling the wiper.

1.3 Modified use and guarantee conditions

All modifications or defects in the product are subject to the Orgalime General Conditions of Sale. Contact your vendor if you want to use Exalto wipers for a non-maritime environment or for another application, or in case of any doubt.

2 Technical data

2.1 General

- Product ..... Exalto windshield wiper
- Types ..... 235 KK – 12 Volt and 24 Volt
- Catalogue numbers 12V 2154.00/05/10/15/20
- Catalogue numbers 24V 2155.00/05/10/15/20

2.2 Electrical data 12 Volt

- Torque (max.) ..... 15 Nm
- Voltage ..... 12 Volt
- Current ..... 3 A
- Power consumption (max.) ..... 36 W
- Recommended cable ..... 5 wires, 1½ (16 g) or 2½ mm^2 (14 g)
  ..... up to 10 m long
- Recommended fuse ..... 6 A slow blow
- Grounding ..... Not insulated, negative earth

2.3 Electrical data 24 Volt

- Torque (max.) ..... 15 Nm
- Voltage ..... 24 Volt
- Current ..... 1.5 A
- Power consumption (max.) ..... 36 W
- Recommended cable ..... 5 wires, 1½ (16 g) or 2½ mm^2 (14 g)
  ..... up to 10 m long
- Recommended fuse ..... 4 A slow blow
- Grounding ..... Insulated earth return

2.4 Mechanical data

- Dimensions ..... l x w x h = 180 x 113 x 120 mm
- Bearing diameters ..... Drive shaft ∅20 / support shaft ∅8 mm
- Mounting ..... In bulkhead (20/55/75/100/125 mm)
- Bearing ..... Bronze housing, self-lubricating
- Wiperarms ..... Model PU up to 600 mm
- Wiperblades ..... Up to 600 mm
- Wipe arc ..... Wipe arc disc 40°-90° adjustable per 5°
- Number of revolutions ..... Low 54 rpm, high 76 rpm
- Weight ..... 1.5 kg

3 Installation

Read the chapter on safety. Check before installation if the parts are all present and undamaged. In case of errors, contact your vendor.

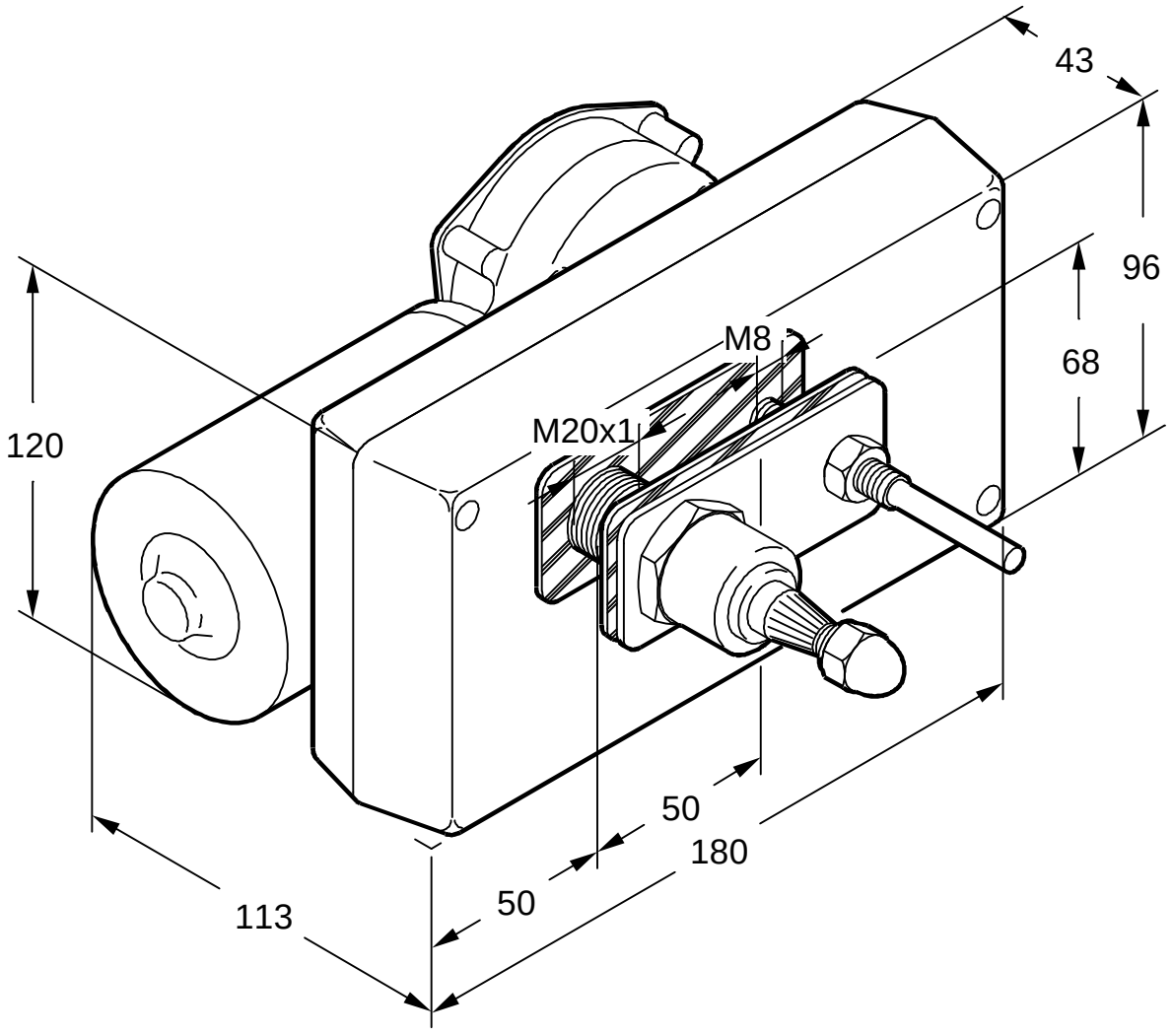
3.1 Preparation

The complete wiper, with packaging, can be handled and transported by hand. Leave the wiper in the packing, until you're ready to install it; this to reduce the risk of damage. Make sure all parts, tools and other means are ready.

3.2 Installation of mechanical parts

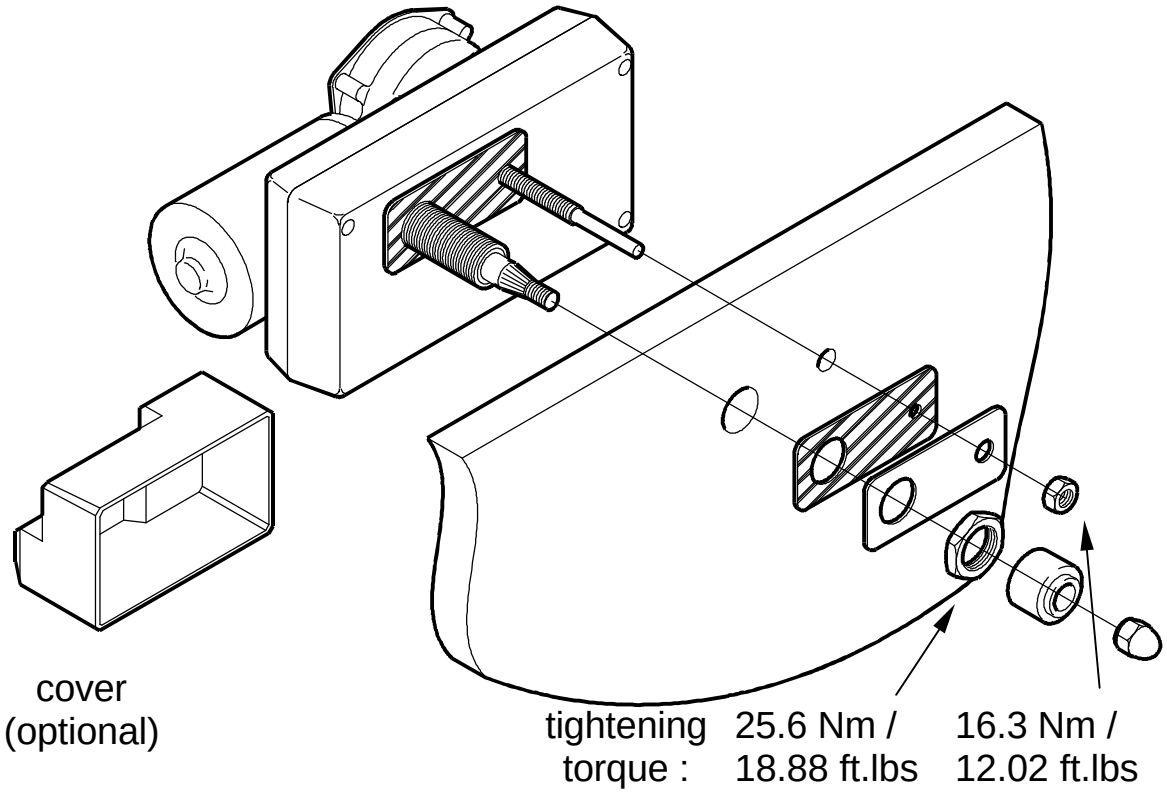
1. If your wiper is supplied with the wipe arc disc uninstalled, please follow the steps 5.3 and 5.4 (pages 11-12) to set the wiping arc prior to installation.

   Determine the spot where the wiper is to be installed. The dimensions are shown below. The wiper may be installed in any position.



Attention!

When installing the wiper, reserve space for a housing or cover.



2. Plac

3. Nov

3.3 E

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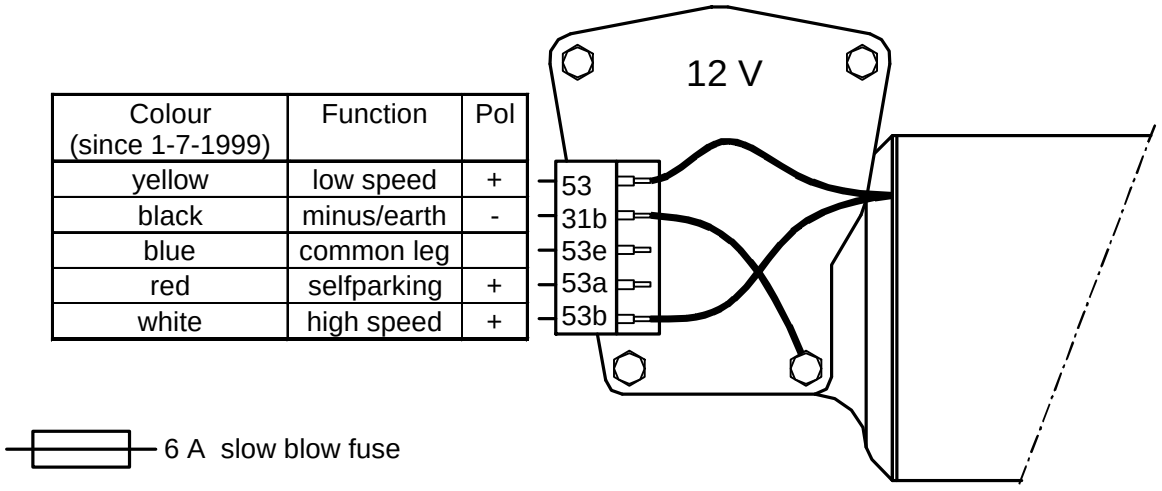
4. Install a wiper switch in the dashboard.

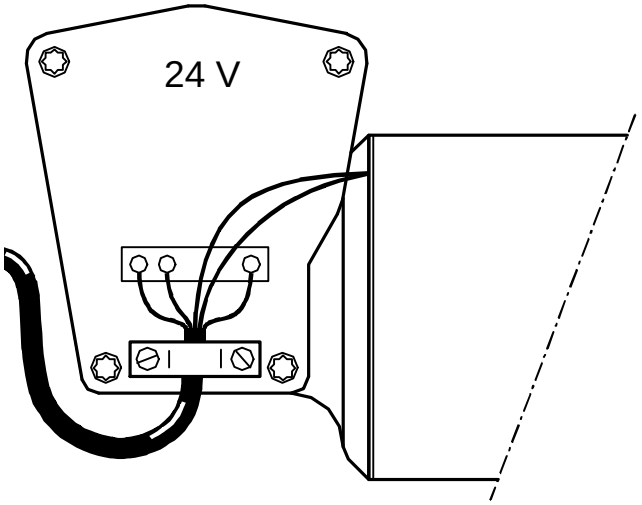
Electrical connection scheme 235 KK 12 Volt

Colour (since 1-7-1999)	Function	Pol
yellow	low speed	+
black	minus/earth	-
blue	common leg	
red	selfparking	+
white	high speed	+



Electrical connection scheme 235 KK 24 Volt

Colour (since 1-7-1999)	Function	Pol
yellow	low speed	+
black	minus/earth	-
blue	common leg	
red	selfparking	+
white	high speed	+



5. Connect the wiper to the ship's electrical installation; see the schemes above. Use a cable consisting of 5 wires with cross-sections of at least 1½ mm^2 (16 g) up to a maximum of 10 m. Use larger cross-sections when using longer cables.

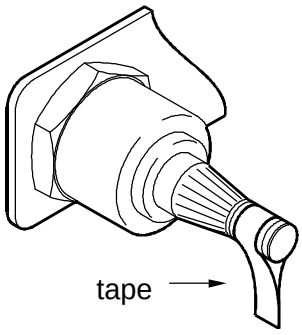
6. Place a slow blow fuse of 6 A (12 Volt) resp. 4 A (24 Volt) in the main cable.

7. Connect the switch to the wiper (refer to that specific manual for installation).

3.4 Final installation

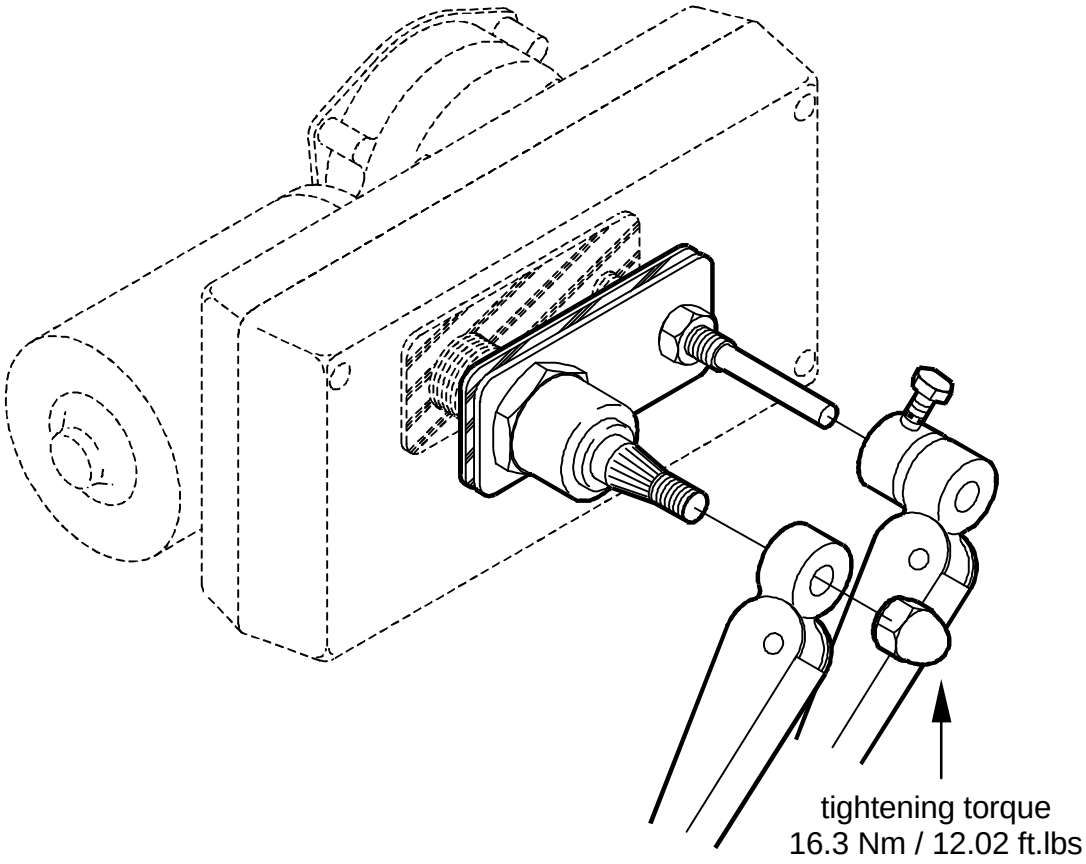
8. Testrun the motor briefly. Wait until the motor stops after turning the switch off. If the wiper is well installed, the motor will be in park position. The standard park position is shown in the figure under point 9.

Hint!
If you have doubts regarding the park position, make a vane with tape to simulate the position of the arms.



Attention!
The 235 KK is suitable for wiper arms model PU up to 600 mm and matching blades up to 600 mm.

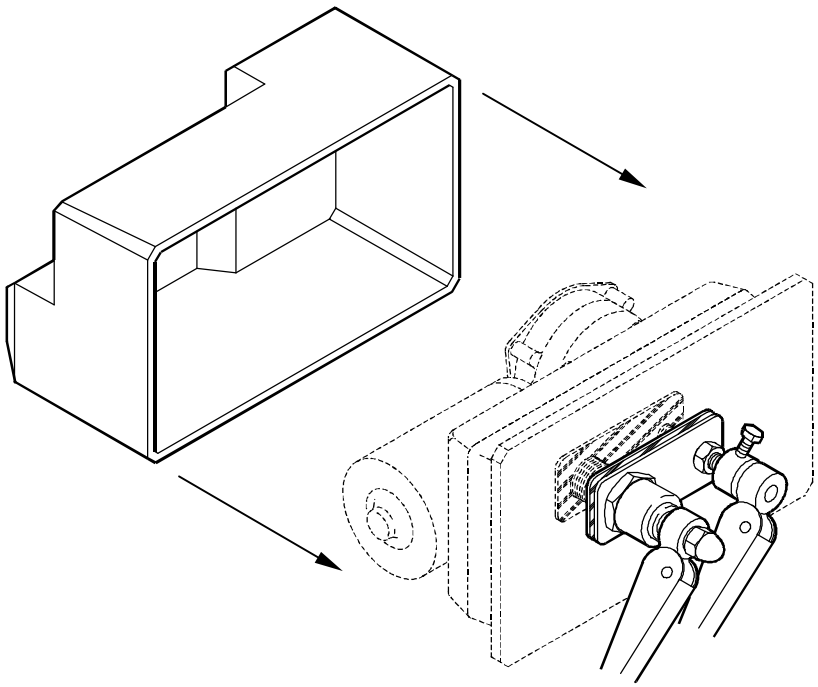
9. Place the wiper arms with the blade on the shafts. Fasten the nuts onto the shafts, but not too tight yet.



10. Testrun the motor again to check the wiped area.

11. If the wipe arc is correct, adjust the position and the length of the arm if necessary. Tighten the nuts properly now.

12. To complete the installation, the wiper must be enclosed by means of a panel or cover. Provide the wiper with enough ventilation.



4 Operation and use

4.1 Preparation for first use

If the wiper has been installed and been adjusted, the system can be prepared for first use. We recommend a thorough inspection of the system to ensure proper operation.

Check:

… if there are no leaks where the bearings go through the window;

… if the set wipe arc cleans the entire window;

… if the park position is correct.

If the wipe arc or the park position is wrong, adjust them again. Follow the procedure in section 5.3.

4.2 Use

All Exalto windshield wipers are provided with the following functions:

- low speed;
- high speed;
- self parking.

Don't run the wiper on a dry window; excessive wear of the blades and the motor can occur. Clean the wiper frequently (see also paragraph 5.1).

Because of the big variety of wiper switches, refer to the user manual of the applied switch to learn about the functions of that specific switch.

5 Maintenance

5.1 General maintenance

To keep the Exalto wiper in good condition, you are advised to:

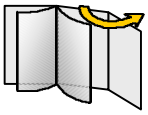
- clean wiper, arms and blades with fresh water after every journey in salt water (to prevent salt from clogging moving parts);
- prevent running the wiper on a dry window.

5.2 Servicing

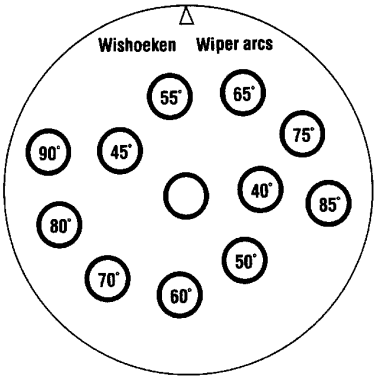
As long as the wiper system functions normally and is kept in good shape (see section 5.1), servicing the drive is not necessary. Check yearly (monthly when used intensively) if the wiper blades are worn. Replace blades when worn, or when the blades leave many stripes across the glass. In case of failure or adjustments, have servicing done solely by qualified mechanics. In chapter 6, “Troubleshooting”, a listing is given of possible troubles.

5.3 Changing the wipe arc and park position

If the wiped area is not optimal, the wipe arc and park position can be changed. Always isolate the electrical circuit before opening the housing.



Adjusting the wipe arc

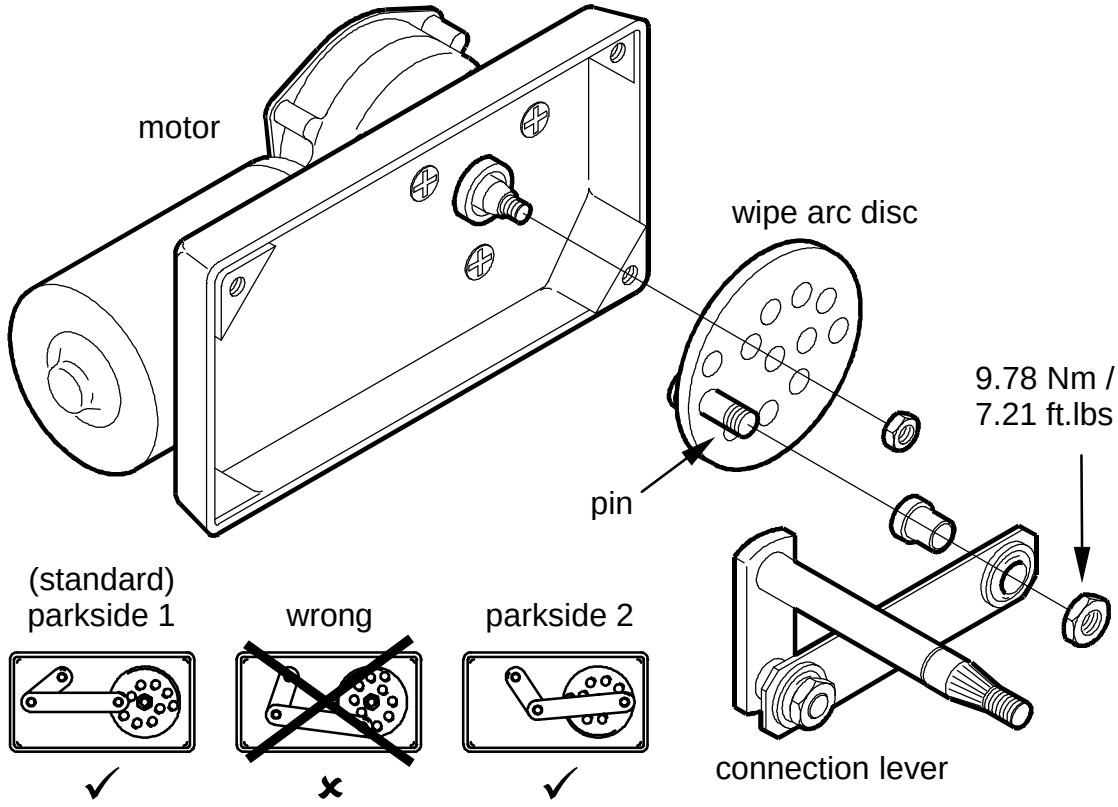


- Isolate the electrical circuit;
- open the housing;
- remove the wipe arc disc (see figure on the right) from the motorshaft;
- move the pin to the hole of the desired wipe arc (see section 5.4);
- fasten the nut on the pin not too tight (max. 9.78 Nm / 7.21 ft.lbs), to prevent damage of the plastic spacer;
- run the motor briefly to park it;
- place the disc in the desired park position (see the text below).

Adjusting the park position

- Place the disc loose on the shaft, parking right or left (see the drawing in paragraph 3.4 and below for reference);
- place the disc in such a way that the connection lever forms a straight line with the pin and the central hole of the disc (see the drawing below);
- tighten the disc well now;
- place and fasten the housing;

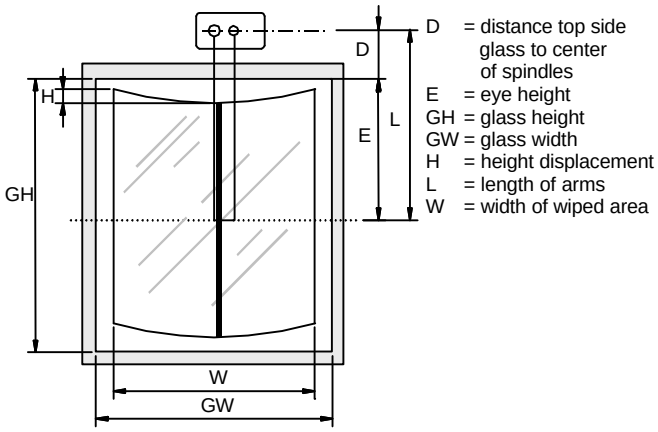
- adjust the wiper arm to the correct length, if necessary.



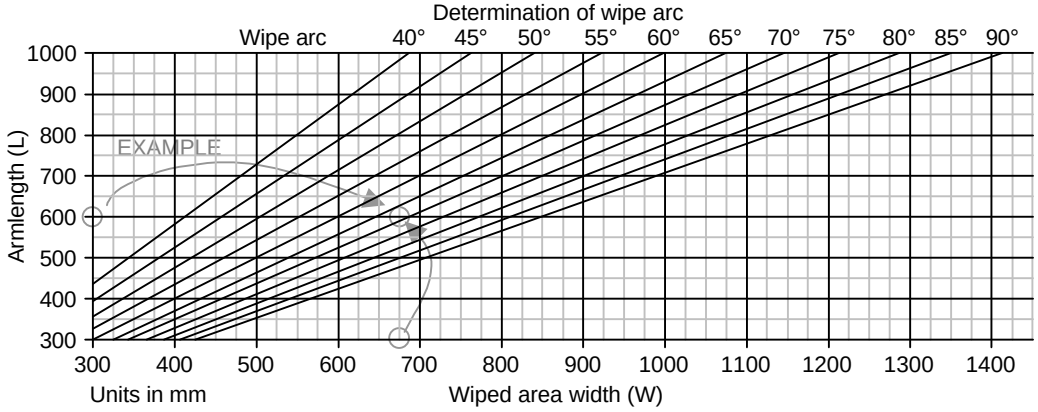
5.4 R

of wipe arc and wiper blade

With this method the wipe arc and the wiper blade can be determined roughly. Contact your vendor to determine your configuration more accurately.



- Determine length of panto-graph arm (L): ***L = E + D***
- get the maximum wiped area width (W): ***W = ±0.9 * GW***
- find the intersection of L en W in the diagram below;



- the wipe arc-line closest to the intersection, shows the wipe arc;

- find in the table below the vertical displacement of the blade (H);

Determining the vertical displacement of the wiper blade

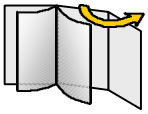
Armlength (L)		300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
Wipe arc	40°	19	21	25	26	30	34	37	40	43	45	48	51	54	57	60
	45°	23	27	30	35	38	42	46	50	53	57	61	65	68	72	76
	50°	26	33	36	43	47	52	56	61	66	70	75	80	84	89	94
	55°	34	40	45	51	57	62	66	74	79	85	90	96	102	107	113
	60°	40	47	54	60	67	74	80	87	94	100	107	114	121	127	134
	65°	47	55	63	71	79	86	94	102	110	117	125	133	141	149	157
	70°	55	63	73	81	90	100	109	118	127	136	145	154	163	172	181
	75°	62	73	83	93	104	114	124	135	145	155	165	176	186	196	207
	80°	70	82	94	105	117	129	140	152	164	175	187	199	211	222	234
	85°	79	92	105	119	132	145	158	171	184	197	210	223	236	250	263
	90°	86	103	117	132	146	161	176	190	205	220	234	249	264	278	293

Units in mm — Vertical displacement of the blade (H)

- Now the wiper blade can be calculated:
  Length of wiper blade = 0.9 * 2 * (E - H)

5.5 Disassembly and assembly

Prevent injuries when disassembling: isolate the wiper from the electrical installation. Keep all necessary tools within reach and remember the chapter on safety. Provide a protecting packaging, if you're going to stock or transport the wiper.



5.5.1 Removing the wiper assembly from the window

1. Isolate the electric circuit and disconnect the wires.
2. Remove the wiper arms.
3. Remove the nuts (13, 19, 22) and plates (17, 18) on the outside.
4. Remove the wiper out of the holes in the window.
5. For replacing the wiper, follow chapter 3.

5.5.2 Disassembling the wipe arc disc

1. Isolate the electrical circuit.
2. Unscrew the housing (3, 20) (wiper should be removed first; see 5.5.1).
3. Unscrew the nut (6) on the motor shaft and remove the disc (5).
4. For adjusting the wipe arc and replacing, follow section 5.3.

5.5.3 Removing the motor from the wiper assembly

1. Isolate the electrical circuit and disconnect the wires
2. Disassemble the wipe arc disc (5) (see 5.5.2).
3. Unscrew the motor and remove it.
4. When replacing, screw the motor on the housing. Follow section 5.3 to install the wipe arc disc in the correct park position.

6 Troubleshooting

In this chapter, several malfunctions are mentioned combined with possible causes. Please leave servicing to qualified mechanics.

6.1 Wiper doesn't run after switching on

- Possible causes:
  1. Wiper switch has failed.
  2. Burned or incorrectly sized fuse.
  3. Electrical connections are miswired or damaged.
  4. Motor failed.
- Solutions:
  1. Test and replace it. Check if the current is (and keeps being) too high.
  2. (See solution 1).
  3. Test for a charge on the motor and check all connections.
  4. Replace the motor and check for drag or a current that is too high.

6.2 Wiped area or park park position wrong

- Possible causes:
  1. The wiper arms were placed without parking the motor first.
  2. The wipe arc is set wrong or changed due to high loads (e.g. spring tension arms to high; drag).
  3. The wires are connected wrong.
- Solutions:
  1. Remove the wiper arms. Run the motor shortly to park it and re-install the arms according to chapter 3.
  2. Determine the wipe arc if needed (see section 5.4) and set the wipe arc again (see chapter 5.3).
  3. Check and reconnect the wiring (see the scheme in section 3.3).

6.3 Motor runs, but arms don't move

- Possible causes:
  1. Mechanical joints are loose.
  2. Parts are broken.
  3. Grooves of shafts are worn.
- Solutions:
  1. Check if the arms are well fastened. If not, open the housing (follow chapter 5) and check all joints and parts to see if they are loose, broken or worn.

7 Declaration of conformity

MANUFACTURER'S DECLARATION
according to Appendix II sub B of Directive 89/392/EEG (Machines)

Exalto B.V.
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The Netherlands
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hereby declares that

Exalto windshield wiper type 235 KK

… is intended to be built into another machine or as a component, or is to be integrated with other machines to a machine where Directive 89/392/EEG applies to;

… **does not** fully comply to the requirements of mentioned Directive;

… complies to the following harmonised standards:

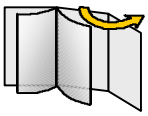
Pleasure yachts

- NEN-EN-ISO 10133 Extra-low voltage D.C. installations (1997) (regarding color codes)

…and declares that the sub-assembly in question shall not be set into operation until the complete machine, into which the sub-assembly is fitted, shall be complete and conforms to all aspects of Directive 89/392/EEG.

Hardinxveld-Giessendam
6-15-2000 (m-d-y)

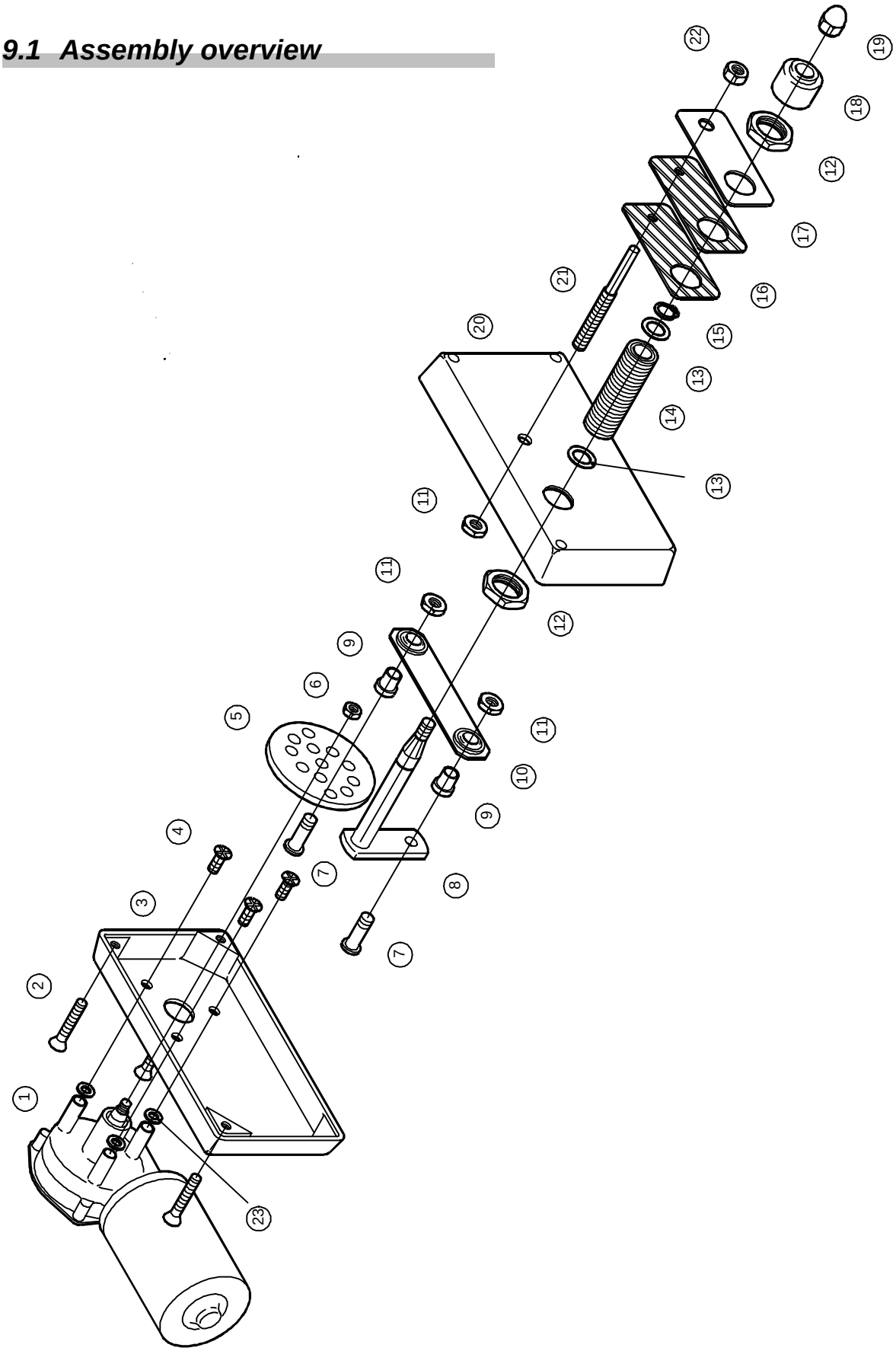
8 Parts list



Nr	Qua	Part	Dimensions	Cat. nr.
1	1	Motor 12 V 15 Nm	170x95x95	2100.310
		Motor 24 V 15 Nm	170x95x95	2100.300
2	3	Socket screw s.s. countersunk (DIN 965)	M6x35	2100.055
3	1	Half wiper shell motor side	180x96x22	2100.902
4	3	Socket screw s.s. countersunk (DIN 965)	M6x16	2100.050
5	1	Arc disc	∅70x5	2100.930
6	1	Nut s.s. (DIN 934)	M6	2100.080
7	2	Linking pin	M8x26	2100.920
8	1	Spindle + spindle lever	Ø12x102	2100.364
		Spindle + spindle lever	Ø12x137	2100.366
		Spindle + spindle lever	Ø12x157	2100.368
		Spindle + spindle lever	Ø12x182	2100.370
		Spindle + spindle lever	Ø12x207	2100.372
9	2	Filling bushing plastic	∅13x14	2100.925
10	1	Linking lever	110x24x2	2100.935
11	3	Nut s.s. flat	M8x4	2100.760
12	2	Bearing shell nut s.s.	M20	2100.350
13	1	Ring s.s.	18x12x1	2100.400
14	1	Bearing shell complete bulkhead 20 mm	M20x65	2100.326
		Bearing shell complete bulkhead 55 mm	M20x100	2100.327
		Bearing shell complete bulkhead 75 mm	M20x120	2100.328
		Bearing shell complete bulkhead 100 mm	M20x145	2100.329
		Bearing shell complete bulkhead 125 mm	M20x170	2100.331
15	1	Locking ring	∅12x4	2100.410
16	2	Rubber locking plate	82x35x3	2100.490
17	1	S.s. locking plate	82x35x3	2100.480
18	1	Rubber dust cap	Ø26x20	2100.361
19	1	Rounded nut s.s. special	M8	2100.346
20	1	Half wiper shell spindle side	180x96x22	2100.901
21	1	Support spindle bulkhead 20 mm	M8x70	2100.446
		Support spindle bulkhead 55 mm	M8x110	2100.447
		Support spindle bulkhead 75 mm	M8x130	2100.448
		Support spindle bulkhead 100 mm	M8x155	2100.449
		Support spindle bulkhead 125 mm	M8x180	2100.451
22	1	Support spindle nut s.s.	M20	2100.460
23	3	Ring s.s. DIN 125A (24 V only)	M6	2100.690

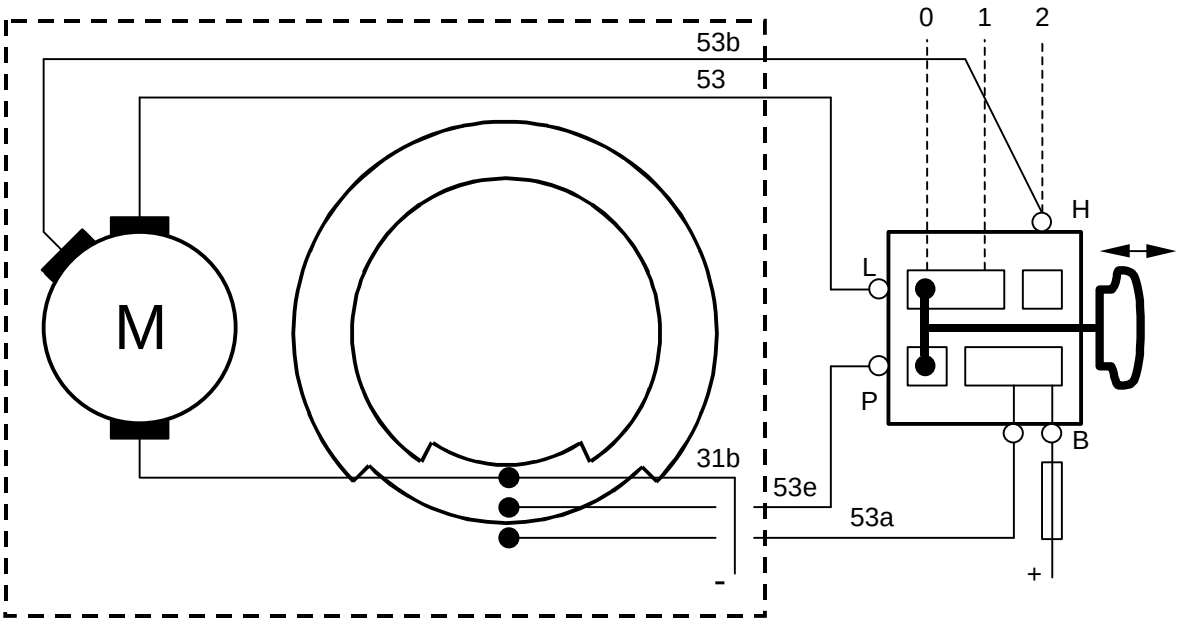
9 Drawings and schemes

9.1 Assembly overview



9.2 Internal wiring diagram

The following diagram is to help understand the principle of the wiper motor.



Function	Polarity	Motor code	Switch code	Cable (since 6-1999)
high speed	+	53b	H	white
low speed	+	53	L	yellow
earth	-	31b		black
common leg		53e	P	blue
selfparking	+	53a	B	red

Some older wipers may have different wire colours. Check the diagram below to compare the colour combinations.

Function	Current cable (since 6-1999)	Previous cables (before 6-1999)		
high speed	white	red	red	6
low speed	yellow	yellow or white	yellow	5
earth	black	blue	blue	4
common leg	blue	green	grey	3
selfparking	red	black	black	7

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